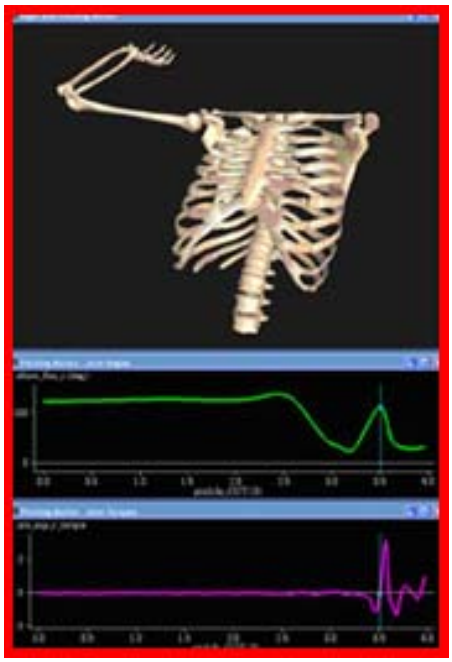
FIT Module



The FIT (Forward Inverse Dynamics Tool) Module allows you to perform forward and inverse dynamics simulations on your musculoskeletal models, without any programming. It works by loading pre-compiled simulations of generic models and then customizing them to match your particular model.

For inverse dynamics, you can load a motion into the FIT Module and specify which properties, such as joint torques and joint contact forces, you would like to calculate. SIMM uses a novel dynamics technique to calculate these properties, taking into account ground-reaction forces and muscle EMG data, if available. An upcoming version of the FIT Module will use an optimization algorithm to estimate the individual muscle forces that produce the calculated joint torques.

For forward dynamics, you can configure the model in any desired starting position, and specify the excitation patterns of the muscles. You can also apply external forces and torques by defining them in an input file. SIMM then starts the simulation and integrates the equations of motion for the specified time period. The results are shown as they are calculated in the SIMM model window and plot windows. Using the graphical interface, it is quick and easy to run a simulation, examine the results, and then adjust the muscle excitations or other import variables and run another simulation.

In conjunction with the Real-Time Motion Module, the FIT Module is a powerful toolkit for performing dynamics analyses on virtually any recorded motion. The recorded marker data (TRB, TRC files) is imported into SIMM and mapped onto a full-body model (with masses, inertias, and muscles) that is scaled to fit the size of the subject. If desired, the imported motion can then be cropped, and events can be added to it (e.g., heelstrike, toe-off).

Features

- Inverse dynamics on any imported motion
- Forward dynamics driven by muscle excitations
- Simple graphical interface for running simulations
- Real-time update in SIMM window
- Results can be normalized to allow comparison with other data
- Estimates individual muscle forces during inverse dynamics analysis

MusculoGraphics, Inc.
A division of Motion Analysis Corp.
3617 Westwind Boulevard
Santa Rosa, CA USA 95403
707.579.6500
www.musculographics.com

MUSCULOGRAPHICS INC.